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THE OPPORTUNITY OF THE ENDOWED UNIVERSITY

AT first glance there would seem to be opportunity, in this country, for more than one type of college and university, and if the opportunity, then the obligation and the inspiration. Historically there are two types, but under identical environmental influences they present to-day few distinguishing characters. They exhibit a phenomenon very rare and interesting in biology. While we have been speculating and searching about the origin of species by evolution, the history of the American colleges has recorded the almost complete disappearance of a species through imitation, a transmutation instead of a mutation! The endowed college, later called university, was the first type to appear on the American continent; but with the growth of the public school idea, with the outgrowth of those aristocratic remnants which the early settlers so unconsciously brought with them and so strongly exhibited, and with the immense addition to the English stock by immigration from continental Europe with its universities founded and maintained by the funds of the people, it was only natural that state universities should come into existence. For the most part they are found in those states which have nothing more tangible to connect them with the past than *traditions* of aristocracy, and at all events they prosper most, if one may judge by our usual American standards of dollars or of numbers, in the states in which the people is most thoroughly satisfied that the people can do no wrong. The future, the opportunity, of the endowed university may appear, therefore, to

be anything but bright and inspiring; but an honest examination of the circumstances of the state and the endowed universities will lead any one to rejoice in the prospects of both.

The state university is endowed with the wealth of the state; its endowment increases with the wealth of the state, automatically and without struggle. What this has already meant in certain instances is but a small fraction of what the future has in store. The wealth of the richest of the colleges of Oxford and Cambridge is poverty in comparison with the potential wealth of some of our state universities: unless and until the descendants of the people which called the university into being recall it to a condition of penury. The endowments of the state universities yield incomes the large totals of which are increased at intervals by appropriations for such specific purposes as have won popular or legislative appreciation and approval or may capture the fancy of the self-styled "practical man."

The contrast of the endowed university with all of this seeming prosperity would be disheartening to its friends if they took no account of the influence of the endowment and income. While the income of the state university may grow proportionally with its endowment, its officers and friends take nothing for granted and occupy themselves in securing this happy result. On the other hand, once sufficiently endowed to be useful, the endowed university need not struggle for money. It will never have too much if it wisely spend what it has; and if it transmutes its gold into lives of exceptional usefulness, more gold will come to it from grateful alumni and from admiring friends who would increase its opportunities for service. The endowed universities have struggled for money as desperately as those of the states, but this has been either because they were insufficiently endowed or because their administrations, not content with usefulness, lusted after bigness also. But given a sufficient endowment, so managed that its income will be both fair and uniform, the endowed university is independent as no state university ever is: not free from duties, but free from hindrances.

What the people wants, what it pays for, it rightly insists upon having. The people goes further and says that these things all the citizens of the state should have. The people insists above all upon training for practical life. To the schools of law and of medicine, agriculture and engineering, it enthusiastically and optimistically adds courses in domestic science, poultry husbandry, cheese-making, and the rest. Has it occurred to the "practical" legislator or the "practical" voter that the establishment of courses in domestic science has been followed by a more acute stage of the servant question? Is this mere coincidence?

The people demands of its university that it be in every way useful, that, where training is impossible, at least it should give information. In response to this demand come university extension (not university elevation), summer schools, farmers' institutes, short courses and correspondence. The young American democracies provide not only a "royal road to learning," but omnibuses traveling rapidly over the road with pneumatic tires—I forbear to mention the temperature of the air which fills them. These omnibuses always take in and discharge their passengers in haste and confusion, sometimes even in darkness. They must be driven by persons capable and sometimes desirous of taking a more promising company over a less commonplace road, whence the views, forward

and perhaps even upward, may be more extended.

As part of the educational system of the state, the state university must admit all presenting a high school diploma. It can not sift, and exclude the ignorant, for there is none ignorant, as the certificates show! It can not insist that the boy who would be an engineer present himself with a usable knowledge of algebra and geometry. It is obliged to accept as a working basis the popular delusion that all subjects furnish equally good preparation for college as well as for everything else, that all study is equally informing and developing, that all students are equally fit. But in so doing, in its seeming liberality in keeping its front door apparently so wide open, it places obstacles in the way of all who would enter from any other than the conventional school. The seriousness of these obstacles is seldom apprehended by others than those who encounter them. The boy whose family has traveled, taking him with them—the son of an engineer, or a missionary of commerce or religion, for example—having attended an accredited school for too short a time to receive a certificate, or being taught in a private school or in still more private lessons quite unknown to a registrar's office, finds himself unable to enter the wide open front door of the usual college, state or endowed. Although very likely more mature and better trained, of wider as well as more definite or first-hand knowledge, of broader experience and more independent thought, he is refused admission unless, by passing examinations to which only he and his kind are subjected, he convinces the authorities that he knows almost as much as a boy from the Bean Blossom High School in Posey County.

The state universities are more or less compelled to take the products of the public schools unsifted; they can not especially cultivate and encourage the exceptional young person; they must do mainly a wholesale business; and they are increasingly burdened with great numbers of conventionally trained mediocrities. They are necessarily organized to receive, care for, graduate and find positions for these. Thus they annually produce more teachers who will produce more students of the same mediocre sort. What this weight of numbers is may be indicated by the attendance, in round numbers, on the usual elementary course in botany at the following universities:

Wisconsin	300
Minnesota	500
Nebraska	350
Stanford	50

Botany I. at Harvard, a fairly large course (130), is not the equivalent of Botany I. at the universities above mentioned, and the corresponding course has between 40 and 50 in it. Granting the stimulation of lecturing to large numbers, what is the effect of attempting laboratory work for so many? Providing, in the winter, plant material for such numbers, organizing and directing the staff of assistants, conferring with students in this and in the more advanced courses, the head of the department and his colleagues find their time, their strength, and finally their desire, for their own researches exhausted. There is no time for reflection; every one is so busy doing that there is no opportunity for thinking; every one is working at high pressure, but is it worth while? Researches come from these laboratories, but they are not original. They are the products of the changing fashions rather than the fruit of individual effort. A glance at the programs of the national scientific societies proves that isotonic coefficients and chromosomes have been displaced by mutation, Mendelism, and plant-breeding. American

universities add annually to the "literature" of science, and in the great numbers of elementary students to be cared for I think we can all see one great reason why the contributions of promising American scientific men have reached no higher level.

Turning now to the endowed university, it is obvious that its officers need spend no time at the capitol, for its income can not there be increased; they need make no concessions in order to keep Greek from disappearing from the catalogue; they can let others wrestle with the problems of "educational psychology," "humanics" and "live stock practise" while devoting themselves to psychology, sociology and zoology. The endowed university may go its own way independent of the currents of fashion and of popular whim. It is naturally sheltered from those influences. It is only when its leaders attempt to duplicate the work of the state university that it finds itself exposed to the same influences. And when it exposes itself to these influences, it does so without the defenses of the state university.

The opportunity of the endowed university is a great one, inspiring to contemplate. It, or its *directing* administration, may determine its course, select the subjects it will teach, specialize instead of generalize, foster pure science and the arts. Whether American universities be democracies or autocracies, all or some of the officers of the endowed universities have the opportunity, and the obligation, to decide what these universities will do—whether to compete on unequal terms of wealth and of other forms of support with the state universities, to seek numbers, to strive for bigness, to submit to the fashion, to comply with the current wish: or to decide what it will attempt, what subjects it will cultivate, to teach and to investigate and to develop these to a degree unequaled elsewhere; to pursue the studies of pure science, the humanities and the arts as assiduously and as devotedly as if they were themselves the keys to wealth.

The endowed universities may select their students on any basis that they will; may pick the children of the well-to-do or young people whose unprogressive parents have cruelly limited them to schooling in Latin, Greek and mathematics when they might have "taken" hygiene, civics and "vocational subjects"; may, on the other hand, welcome the exceptional as well as admitting the usual; may cultivate and encourage the best. The endowed university may as consciously and as definitely prepare for the few, for the unusual, the most original and the most stimulating student as the state university must certainly prepare for unsifted numbers.

The masses of a democracy recognize present wants more surely than they anticipate future needs. They require an immediate supply to meet an existing demand. They consider their state university to be well fulfilling its functions when it furnishes such a supply. How well it succeeds in this the fair-minded observer admiringly acknowledges. But the wholesale business of the state university limits, if it does not practically prevent, that attention to the exceptional student which may result in training a leader of his generation, a seer who, divining the future needs of the state, may begin to prepare to meet them, a man who, profiting by the recorded experience of the past, may mold as well as meet conditions. The training of workers is the duty of the state and of the endowed university; the training of leaders is the privilege more especially of the endowed universities for the reasons I have given. How well some of the endowed universities have apprehended and lived up to this privilege the records of

Harvard and Yale, of Columbia and Princeton, and of Johns Hopkins *sui generis,* fully attest. May they not neglect their privilege and abandon their peculiar work!

What the endowed universities have successfully and naturally done for generations some of the state universities are now attempting against opposition of every sort. How successful, judging only by the test of quality, not of numbers, these universities will be in producing statesmen, jurists, economists and explorers in the fields of pure science, it is still too early to say. To recognize these in embryo, to train these young people for their distinctive careers, is easier for the endowed university than for that of the state, provided only that the endowed university, realizing its privilege and confining its efforts to its special field, does its duty. This, I take it, is the special service which the endowed university can perform, its reason for existence by the side of the university of the state, not copying it, not competing with it, but supplementing it, training leaders.

Their numbers, their courses, limited by their incomes, the endowed universities may remain small with no sense of shame or of failure. The Rookwood Pottery is smaller than many a brick-yard, yet all are needed, all are useful. In the space and quiet of "the yard" or of the quadrangle there is time for reflection, for review, which in the past have led to real contributions to knowledge or to thought. The scholar's life and the scholar's product, not fostered by the conditions of office or consulting-room, may continue if the endowed universities recognize and cherish their high privilege, serving the state and the world with their own peculiar talent, not copying the form or attempting the task of their huge neighbors, not seeing in them rivals but friends. May these allies, realizing their privileges, their distinctive opportunities, win the glories of their recognized usefulnesses!

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RESEARCH ON THE SMOKE PROBLEM AT THE DEPARTMENT OF INDUSTRIAL RESEARCH OF THE UNIVERSITY OF PITTSBURGH

SMOKE exists to a greater or less extent in every city where soft coal is burned. The world at large has not, up to the past few years, regarded it as a waste. It has been considered synonymous with prosperity. Its right to cloud the heavens has been traditional. The enormity of this evil is fast being forced upon the public attention so that the manner in which it is being combated in the big metropolitan centers affords an interesting and profitable subject for study.

Strange to relate, when one stops to consider the breadth of interest and importance of this problem, together with the fact that so many thousands have worked on its various phases, and that so much has been written and is being written on the subject, still no coordinated effort of one group of men has been made to undertake a scientific study of the problem as a whole. One of Pittsburgh's most public-spirited citizens, a man devoted to the city's welfare, recognizing this fact, has established a fellowship of $12,000 per year with the department of industrial research of the University of Pittsburgh for the scientific investigation of this problem.

We have an unpretentious laboratory, designated as the "smoke house," a small, fireproof building, 18 feet wide and 30 feet long, which is situated at a sufficient distance from the main laboratory, so that the smoke in quantities as great as we may need in our work can be made without interfering with the other researches being carried on. In this building there is a furnace, so constructed that it is possible, by varying conditions, to get any kind of coal smoke. This statement may, perhaps, appear peculiar to those who have always considered smoke as just smoke, but our studies